

ACCESSION NR: AP4006481

5/0020/63/153/005/1020/1023

AUTHORS: Petrov, B. N. (Academician); Yemel'yanov, S. V.

TITLE: The principle of constructing combined automatic control systems with variable structure

SOURCE: AN SSSR. Doklady*, v. 153, no. 5, 1963, 1020-1023

TOPIC TAGS: combined servo system, servo system, variable structure, control system, control response reproduction accuracy, linear non-homogeneous differential equation, static reproduction, dynamic reproduction, open loop structure, closed loop structure, variable structure servo

ABSTRACT: Combined servos are used in many cases in order to improve the static and dynamic fidelity of reproduction of the manipulated variable. The transient responses in such systems can be described by a linear nonhomogeneous differential equation $M(p)x = N(p)z(t)$, where $M(p)$ and $N(p)$ are operator polynomials with respect to p ; $p \equiv d/dt$; x is the error signal; and $z(t)$ is the manipulated variable, being a continuous time function. Independence of the error signal

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x from the manipulated variable $u(t)$ is generally determined by the condition $N(p)=0$. In this case, the forced component $x_{forced}(t)$ for the general solution of equation (2) is identically equal to zero. In a general case, the following are required to satisfy equation (2): (i) differentiation of the manipulated variable; (ii) invariability of the parameters for the open and closed loops of the combined sews system. Authors attempt to solve this problem, not attempting to fulfill the conditions of (2) and by weakening the above limitations (i) and (ii). Authors constructed a combined servo system in such a way that when the closed and open loop parameters are changed in sufficiently wide limits and various functions of the manipulated variable $g(t)$, (i) a domain U would exist which would contain the origin of the coordinates and the solution of the system of differential equations $dx/dt=f^0(x)$ would satisfy the given requirements with respect to quality of control process (control period and maximum dynamic error should not transcend certain given values); (ii) under any initial conditions the solution of the system of equations $dx/dt=f(x,g(t))$ would fall in the domain U , wherein the coordinate x , would change sign not more than once; (iii) there would not exist

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any trajectories in the domain U which would serve as segments of limit cycles with partially sliding regime. Then the solution of the initial system of differential equations $dx/dt = f(x, \gamma(t))$ will depend upon the controlling disturbance and parameters of the closed and open loops only up to the moment when $x(t)$ falls into the domain U , where the solution coincides with the solution of the system of homogeneous differential equations $dx/dt = f^0(x)$. Because the transient response terminates in the domain U , the combined servo system reproduces a wide class of manipulated variables $\gamma(t)$ without static errors, and, inasmuch as the solution in U depends only upon the coefficients of, the influence of the closed and open loop parameters upon the quality of the control process will essentially weaken. Orig. art. has: 4 Figures and 10 Equations.

ASSOCIATION: Akademiya nauk SSSR (Academy of sciences SSSR)

SYNTHESIZED: 30Jul63

DATE ADJ: 09Jan64

ENCL: 00

SYB CODE: 00

NR REP SOV: 001

OTHER: 000

Card 3/3

PETROV, B.N., akademik; YEMEL'YANOV, S.V.; DUDIN, Ye.B.

Selection of criteria for the synthesis of combination
servosystems of variable structure. Dokl. AN SSSR 153 no. 1:
1280-1283 D 1983. (MIRA 17:1)

"APPROVED FOR RELEASE: 07/19/2001

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CIA-RDP86-00513R001240420008-0"

1981. 11, Identity Alex e etich; IZIROV, A., Kamenik, IV. red.

Electrodynamic serv drive - elektrodinamicheski
slediaschii privod. Moskva, Izdat. "Mashina," 1981.

(U.S.A. 1981)

PETROV, B.N., akademik. otv. red.; ALEKSEYEV, K.B., red.

[Adaptive control systems] Samonastroyal'nyye avtomaticheskiye sistemy. Moskva, Nauka, 1962. 200 p. (MIRA 18:8,

1. International Federation of Automatic Control.

K'LE AKIN, V.S., akad. iz., stv. red.; PET'KOV, S.N., akademik, stv. red.; GIL'E, A.A., doktor tekhn. nauk, red.; K'LE AKIN, A.A., doktor tekhn. nauk, red.; IVAKHNEVA, A.S., red.; ISHLINSKIY, A.Yu., akademik, red.; KOSTUCH, S.M., kanz. tekhn. nauk, red.; K'ASSOV, I.M., kanz. tekhn. nauk, red.; K'INSENIY, V.M., kanz. tekhn. nauk, red.; K'HELENE, A.I., red.; K'VA'G, A.A., doktor tekhn. nauk, red.; K'ING'G, M.I., doktor fiz.-mat. nauk, red.; K'LAN'G, I.N., doktor tekhn. nauk, red.; K'LO'G, S.M., kanz. tekhn. nauk, red.; K'LYANIN, Ye.Z., doktor tekhn. nauk, red.; K'LYANIN, I.I., kanz. tekhn. nauk, red.; K'LOVA, I.N., kanz. tekhn. nauk, red.; K'LOVSKIY, A.Yu., kanz. tekhn. nauk, red.

[Inventoriy tekhn. izobrazheniy i izobrazheniy; izobrazheniy i izobrazheniy] Tekhn. izobrazheniya v avtomaticheskikh upravleniyakh; izobrazheniya, izobrazheniya, izobrazheniya.

1. Ye. K'uzn'ov. Sovetskaya nauka po teorii avtomaticheskikh upravleniy i avtomaticheskikh upravleniy. (Sovetskaya nauka, Moskva, 1968). (Sovetskaya nauka, Moskva, 1968). (Sovetskaya nauka, Moskva, 1968).

L 34510-65 EWT(d)/EWP(1) Pg-4/Pk-4/Il-4/Po-4/Pq-4 LJR(o) BC/OS

ACCESSION NR: AT5004110

S/0000/64/000/000/0026/0048 47
B+1

AUTHOR: Petrov, B. N. (Academician); Kukhtenko, A.I. (Corresponding member
AN UkrSSR)

TITLE: The structure of absolutely invariant systems and conditions for their
physical realization

SOURCE: Vsesoyuznoye soveshchaniye po teorii invariantnosti i yeye primeneniyu v
avtomaticheskikh sistemakh, 2d, Kiev, 1962. Teoriya invariantnosti v sistemakh
avtomaticheskogo upravleniya (Theory of invariance in automatic control systems);
trudy soveshchaniya, Moscow, Izd-vo Nauka, 1964, 26-48

TOPIC TAGS: invariance, invariant system, nonlinear system, differential equation,
automatic control system 16

ABSTRACT: This somewhat lengthy paper is devoted to a study of absolutely in-
variant systems. The first part of the paper proves various necessary and suf-
ficient conditions for the physical realization of absolutely invariant systems.
The second part of the paper studies the properties of absolutely invariant systems,
based on the physical realization theorems of the first part. In the remainder of
the paper, these general theorems are applied to small classes of systems: a
system with one regulated parameter, systems with two channels transmitting an

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L 34518-65

ACCESSION NR: AT5004110

arbitrary perturbation, systems built on a combinatorial principle of regulation, systems with indirect measurement of perturbations, multi-dimensional systems using a deviational principle of regulation, and non-linear invariant systems. Orig. art. has 10 figures and 64 formulas.

ASSOCIATION: None

SUBMITTED: 24Sep64

ENCL: 00

SUB CODE: MA, IE

NO REF SOV: 021

OTHER: 001

Card 2/2

ACCESSION NO: AP4036404

S/0030/04/000/004/0039/0044

AUTHOR: Petrov, B. N. (Academician)

TITLE: Department of mechanics and control processes (Report of Academician B. N. Petrov)

SOURCE: AN SSSR. Vestnik, no. 4, 1964, 39-44

TOPIC TAGS: cybernetics, automation, control process, stability problem, nonlinear system, discrete system, impulse system, reliability theory

ABSTRACT: This report was presented by Academician B. N. Petrov at the general assembly of the Academy of Sciences SSSR, the topic of which was: "State and Development of Science in 1963." Some achievements in the field of mechanics and automatic control theory are reviewed. Most of the discoveries were associated with the branches of third dynamics, solid state mechanics, mechanics of polymer materials, theory of machines, automatic machine systems, theory of working processes, and the information theory and its application. Main attention was given to the automation of chemico-technical processes and to the search for new automatic control principles. Formerly, the principle of the continuous linear

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ACCESSION NR: AP4036404

systems was applied to the solution of the control problems, but present, more sophisticated, practice calls for the design on the principles of nonlinear, discrete, or impulse systems. Particularly important was the development of a new theory of the variable structure systems which was successfully applied to the automation of metallurgical processes. A new theoretical foundation for the design of selfadjusting systems is in the process of development. Self-instructing machines which improve their control strategy during the working process are the main goal of automation research for the near future.

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 20May64

ENCL: 00

SUB CODE: DP

NO REF SOV: 000

OTHER: 000

Card 2/2

ACCESSION NR: AP4041966

S/0280/64/000/003/0109/0116

AUTHOR: Petrov, B. N. (Moscow); Starikova, M. V. (Moscow)

TITLE: Determination of oscillatory processes in complex nonlinear systems for various initial deviations

SOURCE: AN SSSR. Izv. Tekhnicheskaya kibernetika, no. 3, 1964, 109-116

TOPIC TAGS: automation, automatic control system, nonlinear control system, control system stability, control system oscillation

ABSTRACT: A method is proposed for determining the presence of periodic solutions in a high order nonlinear automatic control system. The system satisfies filter conditions, i.e., the harmonic balance methods of N. N. Krylov and N. M. Bogolyubov are applicable. The method of harmonic linearization allows one to represent all the initial conditions as one amplitude A_0 and analysis proceeds in the three-dimensional coordinate system $A, X(A, \omega)$ and $jY(A, \omega)$ where X and Y are real and imaginary parts of the characteristic equation of the system and A is the amplitude axis. Periodic solutions exist if the characteristic plane $F(X, jY, A) = 0$ intersects the A -axis and the values of A and ω at this point correspond to this solution. Since the plane $F = 0$ is generally difficult to find, the method is extended to enable the determination of periodic solutions from the curve $Y(A)$.

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which is determined from the points of intersection of characteristic curves with the plane $\overline{X}, \overline{Y}$. If a periodic solution exists, some branches of $Y(A)$ will intersect the A - axis and the values of A at these points are amplitudes of the periodic solutions. The number of intersections is determined from the signs of dY/dA and Y as A is varied. If the branches of $Y(A)$ follow the Mikhaylov criterion, the periodic solution is stable. A bistable solution results whenever $Y(A)$ has an extremum at $Y = 0$, i.e. $Y(A)$ is tangent to the A - axis. An unstable solution results at the boundary which divides the zones of "attraction" of two stable solutions. An example is given for a system of 3 poles and two-step, odd nonlinearity. Orig. art. has: 19 equations and 7 figures.

ASSOCIATION: none

SUBMITTED: 30Nov62

ENCL: 00

SUB CODE: 1E

NO REF SOV: 008

OTHER: 000

4 Card 2/2

ACCESSION NR: AP4032959

S/0286/64/000/008/0103/0104

AUTHOR: Katy's, G. P., Petrov, B. N.

TITLE: Astro-orientation instrument for controlling the position and movement of space ships. Class 62, No. 152386

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no 5, 1964, 103-104

TOPIC TAGS: artificial satellite, rocket, space ship, automatic control system, space ship automatic control, space ship orientation, astro-orientation, tracking device

ABSTRACT: A patent has been issued for an astro-orientation instrument for controlling the position and movement of space ships, based on measurement of the angles between the centers of three heavenly bodies used as orientation points. It contains three identical telescopes with autonomous tracking systems equipped with scanning devices which determine the displacement of the heavenly bodies serving as orientation points in two mutually perpendicular directions, as well as devices for measuring the angles between the axes of the telescopes and the angles between the axes of the telescopes and those of a coordinate system, rigidly coupled with the hull of the space ship. For the purpose of simplifying the measurement of the angles between the axes of the telescopes, the latter are installed on the inclined journals of the crankshafts of spherical mechanisms which have a coinciding

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ACCESSION NR: AP4032959

central point. In a variant of this instrument, the telescope drive is designed in the form of a carrier-planetary pinion mechanism in order to guarantee the independent movement of each telescope in two mutually perpendicular directions from two controlling motors, installed on the corresponding spherical mechanisms.

ASSOCIATION: none

SUBMITTED: 10Jan62

ENCL: 00

SUB CODE: SV

NO REF SOV: 000

OTHER: 000

Card 2/2

ACCESSION NR: AP4019965

3/0020/64/154/006/1294/1296

AUTHORS: Petrov, B.K. (Academician); Yemel'yanov, S.V.; Utkin, V.I.

TITLE: Principle for designing invariant automatic control systems
with variable structure

SOURCE: AN SSSR. Doklady*, v. 154, no. 6, 1964, 1294-1296

TOPIC TAGS: automatic control, automatic control system, variable
structure, invariant control system, low order astatism, invariance
theory, mathematical determination

ABSTRACT: An attempt was made to make use of some properties of an
automatic control system with a variable structure for assuring a
full reproducibility of the controlled coordinate of the manipulated
variable. It was assumed that the disturbance and manipulated
variables belong to a sufficiently wide class of functions - a class
of polynomials of any, but finite, degree of time. The control
principle should be formulated without a change in the disturbance
or some internal coordinates of the objects. Suppose that the motion
of an automatic control system in the domain G of an n -dimensional

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space $(x_1, \dots, x_n)$ is described by the system of differential equations

$$\frac{dx}{dt} = f(x, \bar{\psi}, t), \quad (1)$$

where

$$\psi_i(x) = \begin{cases} \omega_i & \text{for } \sigma x_i > 0, \\ \lambda_i & \text{for } \sigma x_i < 0, \end{cases} \quad (i = 1, 2, \dots, n-1)^*, \quad (2)$$

ω_i, λ_i, c_i are constants, $c_n = 1$. It is supposed that the object's control is realized by an astatic controller with proportional feedback. In that case, a_i are values which are linearly dependent upon k - the coefficient of the controller's proportional feedback,

$$\Phi(t) = kG(t) + pG(t), \quad G(t) = \sum_{i=0}^{\infty} Q_i(p)g_i(t). \quad (3)$$

The domain U is defined by the relations

$$\begin{aligned} c \frac{dx}{dt} &> 0 \quad \text{for } \sigma < 0, \\ c \frac{dx}{dt} &< 0 \quad \text{for } \sigma > 0, \end{aligned} \quad (4)$$

where $c = (c_1, \dots, c_n)$. According to (1), the condition (4) can be written in the form

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$$\sum_{i=1}^{n-1} c_i x_{i+1} + \left[- \sum_{i=1}^n a_i x_i - \sum_{i=1}^{n-1} \psi_i(x) x_i + \Phi(t) \right] > 0 \quad \text{for } \sigma < 0$$

$$\sum_{i=1}^{n-1} c_i x_{i+1} + \left[- \sum_{i=1}^n a_i x_i - \sum_{i=1}^{n-1} \psi_i(x) x_i + \Phi(t) \right] < 0 \quad \text{for } \sigma > 0$$

As can be seen from (5) the boundaries of the domain U change in time with a change in the value of $\Phi(t)$. The commutated proportional feedback $k(\mu, x)$ should have the form

$$k(\mu, x) = \begin{cases} k_1 & \text{for } \sigma \left(\mu + \sum_{i=1}^n b_i x_i \right) < 0, \\ -k_2 & \text{for } \sigma \left(\mu + \sum_{i=1}^n b_i x_i \right) > 0. \end{cases} \quad (6)$$

Orig. art. has: 1 figure and 8 formulas.

ASSOCIATION: Institut avomatiki i telemekhaniki (Institute of Automation and Telemechanics)

SUBMITTED: 29Nov63

ATD PRESS: 1046

ENCL: 00

SUB CODE: IE

NO REF SOV: 004

OTHER: 000

Card 3/3

ACCESSION NR: AP4022951

S/0020/64/155/001/0061/0064

AUTHOR: Petrov, B. N. (Academician); Yemel'yanov, S. V.; Kosty*leva, N. Ye.

TITLE: Control of linear objects with varying parameters

SOURCE: AN SSSR. Doklady*, v. 155, no. 1, 1964, 61-64

TOPIC TAGS: cybernetics, control theory, automatic control, linear object control, varying parameter, automatic control system

ABSTRACT: This is an investigation of a linear-object automatic control system with varying parameters whose differential equation of motion has the form

$$Q(p)x_1 = P(p)z_{m-1}, \quad (1)$$

where x_1 is the controlled coordinate; z_{m-1} is the action control;

$$Q(p) = \sum_{i=0}^n a_{i+1}(t)p^i, \quad a_{n+1} = 1;$$

$$P(p) = \sum_{i=0}^{m-1} b_{i+1}(t)p^i, \quad b_m = 1;$$

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ACCESSION NR: AP4022951

$$p = \frac{d}{dt}; \quad n > m;$$

$$a_i(t), b_i(t)$$

are some analytic time functions where

$$a_{imin} < a_i < a_{imax}$$

$$b_{imin} < b_i < b_{imax}.$$

The problem is to synthesize the control principle in such a way that the dynamic properties of the system would change only slightly with a change in $a_i(t)$ and $b_i(t)$ over the specified range. This was accomplished in this study by formulating a control principle in which a domain existed in the coordinate space $x_1, x_1, \dots, x_1^{(n-1)}$ wherein the motion does not depend upon the coefficients $a_i(t)$ and $b_i(t)$. This is attained by cutting-in a passive filter(2) with local commutated feedback in sequence with the correcting device(1) (see Fig. 1 of the Enclosure). Orig. art. has: 1 figure and 11 formulas.

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ACCESSION NR: AP4022951

ASSOCIATION: Institut avtomatiki i telemekhaniki (Institute of Automation and
Telemechanics)

SUBMITTED: 29Nov63

ATD PRESS: 3061

ENCL: 01

SUB CODE: IE, MA

NO REF SOV: 004

OTHER: 000

Card 3/4

MILLIONSECHIKOV, M.D., akademik; ARUTYUNOV, Y.A.; NESMEYANOV, A.N., akademik;
TAL'ROSE, V.L., doktor knim.nauk; PAVLENKO, V.A.; KOTEL'NIKOV, V.A.,
akademik; PETROV, B.N., akademik; NOVIKOV, I.I.; MANDEL'SHTAM, S.L.,
doktor fiz.-matem.nauk; VAYNSHTEYN, B.E.; SHCHIL'OVSKIY, N.N., akademik

Problems in the manufacture of scientific instruments. Vest.AN SSSR
35 no.13-14. 1965. (MIRA 18:2)

1. Glavnyy konstruktor Spetsial'nogo konstruktorskogo byuro
analiticheskogo prikorostroyeniya (for Pavlenko). 2. Chleny-
korrespondenty SSSR (for Novikov, Vaynshteyn). 3. AN Kirgizskoy
SSR (for Shchil'ovskiy).

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E 25880-66

ACC NR: AR6003994

with variable structure of open cycle are not very sensitive to changes within a certain range of system parameters. Examples of the use of the proposed construction principle of invariant systems are presented. Eight illustrations. Bibliography of 14 titles. V. M. [Translation of abstract]

SUB CODE: 14, 09

Card 2/2 *TS*

L 57121-65 EWT(d)/EPF(n)-2/ENP(v)/ENP(k)/ENP(h)/ENP(l) Po-4/Pq-4/Pf-4/
Pg-4/Pae-2/Pu-4/Pk-4/P1-4 LJP(c) WW/BC
ACCESSION NR: AP5010568 UR/0020/65/161/003/0544/0546

63
62
B

AUTHOR: Petrov, B. N. (Academician); Rutkovskiy, V. Yu.

TITLE: Invariance of nonsearch model-adaptive systems

SOURCE: AN SSSR. Doklady, v. 161, no. 3, 1965, 544-546

TOPIC TAGS: automatic control, automatic control design, automatic control
system, automatic control theory, model adaptive system

ABSTRACT: The article proves mathematically that, in a nonsearch model-
adaptive system, under certain conditions, the error between the output variables
of the system and those of the model is invariant with respect to the actuating
signal. A system describable by these equations is considered:

$$\text{plant: } \sum_{i=0}^n a_i^*(t) \varphi^{(i)} = -b^*(t) \mu$$

$$\text{controller: } \sum_{i=0}^m c_i \mu^{(i)} = 0$$

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ACCESSION NR: AP5010568

control law: $\sigma = k_0 \left(\sum_{i=0}^{n-1} k_i \varphi^{(i)} - k_{r0} e \right)$

adaptive-coefficients law:

$$k_i = \bar{k}_i + k_{i, \text{ad}}, \quad \dot{k}_{i, \text{ad}} = \int_0^t (\varphi^{(i)} - \varphi_{\text{ad}}^{(i)}) \Phi(\varphi_{\text{ad}}^{(i)}) \text{sign } \varphi^{(i)} dt$$

nonlinear function: $\Phi(\varphi_{\text{ad}}^{(i)}) = \begin{cases} 1 & \text{with } |\varphi_{\text{ad}}^{(i)}| > \Delta_i \\ 0 & \text{with } |\varphi_{\text{ad}}^{(i)}| < \Delta_i \end{cases}$

model: $\sum_{i=0}^n d_i \varphi_{\text{ad}}^{(i)} = g$

The necessary and sufficient condition of invariance is found to be:

$$d_n = \frac{1}{\kappa k_{r0}}, \quad \tilde{s}_i = \frac{\kappa k_{r0} - \kappa \bar{k}_i - a_i}{\kappa k_{r0}},$$

where $\kappa = k_0 b^* / c_r a_0^*$; a_i are the coefficients of a certain polynomial.

This invariance condition can be achieved by using a special loop for adapting the total gain k_0 of the controller. Orig. art. has: 22 formulas.

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L 57121-65

ACCESSION NR: AP5010568

ASSOCIATION: Institut avtomatiki i telemekhaniki AN SSSR (Institute of
Automation and Telemechanics, AN SSSR)

SUBMITTED: 25Dec64

ENCL: 00

SUB CODE: DP, IE

NO REF SOV: 003

OTHER: 000

182
Card 1/3

L 52263-55		UR/0020/65/161/004/0789/0790		17 B
ACCESSION NR: AP5010822				
AUTHOR: Petrov, B. N. (Academician); Rutkovskiy, V. Yu.				
TITLE: Double invariance of the automatic-control systems				
SOURCE: AN SSSR. Doklady, v. 161, no. 4, 1965, 789-790				
TOPIC TAGS: automatic control, automatic control design, automatic control system, automatic control theory				
ABSTRACT: An automatic-control system possesses a "double invariance" if the invariance conditions with respect to the input variables $f_1(t)$ are also the invariance conditions of the operator $A(D, t)$ with respect to the plant parameters; i. e., the independence of the operator $A(D, t)$ of the plant parameters is corollary of the invariance conditions with respect to $f_1(t)$. Hence, the system has zero sensitivity to the plant parameters. It is proven that the nonsearch model-adaptive systems are double-invariant when the plant parameters, after they have gone through arbitrary variations, become constant. Orig. art. has: 10 formulas.				
ASSOCIATION: Institut avtomatiki i telemekhaniki AN SSSR (Institute of Automation and Telemechanics, AN SSSR)				
SUBMITTED: 25Dec64		ENCL: 00		SUB CODE: MA, IE
Card: 1/176		NO REF SOV: 005		OTHER: 000

ACC NR: AP6024368

SOURCE CODE: 0280/66/000/002/0003/0010

AUTHOR: Petrov, B. N. (Academician); Pospelov, G. S. (Doctor of technical sciences,
[Professor])

ORG: none

TITLE: Developmental paths of large control systems

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 2, 1966, 3-10

TOPIC TAGS: systems engineering, control theory, economic planning, operations research,
information theory, economic development

ABSTRACT: Large control systems (LCS) are construed as a hierarchically organized complex whole of controlling and controlled systems interconnected by information channels; the controlling system may be either a purely automatic data processing system or a human collective specially organized for purposes of control and decision-taking. LCS may exist as systems for the control of individual enterprises, transport, branches of the national economy, entire national economy, and so on. A distinguishing feature of LCS is the use of computers to optimize decisions and convert and process the flows of information. LCS are of special interest to the optimal planning and management of the national economy, and the paths of

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ACC NR: AP6024358

their development which deserve special attention are: systems engineering and systems theory; prediction and planning on the basis of mathematical models of development; decision theory; theory of the organization of control systems. The Taylor control theory was considerably refined in the USSR during the 1920s and currently a great deal of interesting research into the applications of the "Taylor" line in control science to the building of socialism is being done in Poland (cf. Starosciak, E. Elementy nauki ob upravlennii. Perevod s pol'skogo. "Progress, " 1965). It would be only natural to combine the Taylor line with cybernetics, operations research and systems engineering into a unified control science. [REDACTED]

SUB CODE: 06, 05, 09/ SUBM DATE: none

Card 2/2

L 07076-67 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l)
ACC NR: AP6024405

SOURCE CODE: UR/0020/66/169/001/0052/0054

AUTHOR: Petrov, B. N. (Academician); Yemel'yanov, S. V.; Gritsenko, M. B.

ORG: Institute of Automation and Remote Control (Institut avtomatiki i telemekhaniki)

TITLE: Autonomy in multiconnected systems of automatic control with variable structure

SOURCE: AN SSSR. Doklady, v. 169, no. 1, 1966, 52-54

TOPIC TAGS: automatic control design, automatic control parameter, algorithm

ABSTRACT: The authors discuss problems related to the synthesis of the control of multi-connected plants whose internal properties determine the presence of finite or differential connections with respect to the control coordinates. The algorithm of the control device must ensure an independent motion with respect to each of the controlled quantities relative to the changes of other control coordinates, i.e., it must satisfy the autonomy condition. The autonomy problem is solved by the methods of variable structure systems. By means of such a system a multiconnected control system is established which is autonomous within a certain subspace of the coordinate phase space in such a manner that the autonomy conditions are only

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UDC: 62.503.3

L 07076-67

ACC NR: AP6024405

weakly sensitive to changes within a wide range of the characteristics of the object under control. Orig. art. has: 10 formulas.

SUB CODE: 13,12 / SUBM DATE: 04Apr65 / ORIG REF: 007

Card 2/2 *LC*

ACC NR: AP6034566

SOURCE CODE: UR/0020/66/170/006/1279/1282

AUTHOR: Petrov, B. N. (Academician); Yemel'yanov, S. V.; Dubrovskiy, Ye. N.; Kortnev, A. V.

ORG: Institute of Automation and Telemechanics, AN SSSR (Institut avtomatiki i teleme-khaniki AN SSSR)

TITLE: Principles in the design of a non-search adaptive automatic control system with varying parameters

SOURCE: AN SSSR. Doklady, v. 170, no. 6, 1966, 1279-1282

TOPIC TAGS: automatic control theory, control system stability, self adaptive control, automatic gain control

ABSTRACT: The authors analyze a self-adaptive automatic control system in which the gain is varied over a wide range as a function of the system's stability. The gain variation is slow compared to the speed of the transient processes. The control system is described by the motion of points in an n -dimensional phase space. The authors show that the dynamic performance of the system is considerably improved, if the vector, governing the motion of the points, changes in accordance with a predetermined relation to the transient system's behavior. The transient behavior is characterized by the time interval Δt which is required for transition of a point from one fixed hyperplane

UDC: 62-50

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ACC NR: AP0034566

of the phase space to another. The control system realized in accordance with this concept includes a functional transformation block which controls the value of the gain coefficient in relation to the system's transient behavior. Orig. art. has: 27 formulas.

SUB CODE: 09,12/

SUBM DATE: 22Jul66/

ORIG REF: 007

Card 2/2

15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300 305 310 315 320 325 330 335 340 345 350 355 360 365 370 375 380 385 390 395 400 405 410 415 420 425 430 435 440 445 450 455 460 465 470 475 480 485 490 495 500 505 510 515 520 525 530 535 540 545 550 555 560 565 570 575 580 585 590 595 600 605 610 615 620 625 630 635 640 645 650 655 660 665 670 675 680 685 690 695 700 705 710 715 720 725 730 735 740 745 750 755 760 765 770 775 780 785 790 795 800 805 810 815 820 825 830 835 840 845 850 855 860 865 870 875 880 885 890 895 900 905 910 915 920 925 930 935 940 945 950 955 960 965 970 975 980 985 990 995 1000 1005 1010 1015 1020 1025 1030 1035 1040 1045 1050 1055 1060 1065 1070 1075 1080 1085 1090 1095 1100 1105 1110 1115 1120 1125 1130 1135 1140 1145 1150 1155 1160 1165 1170 1175 1180 1185 1190 1195 1200 1205 1210 1215 1220 1225 1230 1235 1240 1245 1250 1255 1260 1265 1270 1275 1280 1285 1290 1295 1300 1305 1310 1315 1320 1325 1330 1335 1340 1345 1350 1355 1360 1365 1370 1375 1380 1385 1390 1395 1400 1405 1410 1415 1420 1425 1430 1435 1440 1445 1450 1455 1460 1465 1470 1475 1480 1485 1490 1495 1500 1505 1510 1515 1520 1525 1530 1535 1540 1545 1550 1555 1560 1565 1570 1575 1580 1585 1590 1595 1600 1605 1610 1615 1620 1625 1630 1635 1640 1645 1650 1655 1660 1665 1670 1675 1680 1685 1690 1695 1700 1705 1710 1715 1720 1725 1730 1735 1740 1745 1750 1755 1760 1765 1770 1775 1780 1785 1790 1795 1800 1805 1810 1815 1820 1825 1830 1835 1840 1845 1850 1855 1860 1865 1870 1875 1880 1885 1890 1895 1900 1905 1910 1915 1920 1925 1930 1935 1940 1945 1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080 2085 2090 2095 2100 2105 2110 2115 2120 2125 2130 2135 2140 2145 2150 2155 2160 2165 2170 2175 2180 2185 2190 2195 2200 2205 2210 2215 2220 2225 2230 2235 2240 2245 2250 2255 2260 2265 2270 2275 2280 2285 2290 2295 2300 2305 2310 2315 2320 2325 2330 2335 2340 2345 2350 2355 2360 2365 2370 2375 2380 2385 2390 2395 2400 2405 2410 2415 2420 2425 2430 2435 2440 2445 2450 2455 2460 2465 2470 2475 2480 2485 2490 2495 2500 2505 2510 2515 2520 2525 2530 2535 2540 2545 2550 2555 2560 2565 2570 2575 2580 2585 2590 2595 2600 2605 2610 2615 2620 2625 2630 2635 2640 2645 2650 2655 2660 2665 2670 2675 2680 2685 2690 2695 2700 2705 2710 2715 2720 2725 2730 2735 2740 2745 2750 2755 2760 2765 2770 2775 2780 2785 2790 2795 2800 2805 2810 2815 2820 2825 2830 2835 2840 2845 2850 2855 2860 2865 2870 2875 2880 2885 2890 2895 2900 2905 2910 2915 2920 2925 2930 2935 2940 2945 2950 2955 2960 2965 2970 2975 2980 2985 2990 2995 3000 3005 3010 3015 3020 3025 3030 3035 3040 3045 3050 3055 3060 3065 3070 3075 3080 3085 3090 3095 3100 3105 3110 3115 3120 3125 3130 3135 3140 3145 3150 3155 3160 3165 3170 3175 3180 3185 3190 3195 3200 3205 3210 3215 3220 3225 3230 3235 3240 3245 3250 3255 3260 3265 3270 3275 3280 3285 3290 3295 3300 3305 3310 3315 3320 3325 3330 3335 3340 3345 3350 3355 3360 3365 3370 3375 3380 3385 3390 3395 3400 3405 3410 3415 3420 3425 3430 3435 3440 3445 3450 3455 3460 3465 3470 3475 3480 3485 3490 3495 3500 3505 3510 3515 3520 3525 3530 3535 3540 3545 3550 3555 3560 3565 3570 3575 3580 3585 3590 3595 3600 3605 3610 3615 3620 3625 3630 3635 3640 3645 3650 3655 3660 3665 3670 3675 3680 3685 3690 3695 3700 3705 3710 3715 3720 3725 3730 3735 3740 3745 3750 3755 3760 3765 3770 3775 3780 3785 3790 3795 3800 3805 3810 3815 3820 3825 3830 3835 3840 3845 3850 3855 3860 3865 3870 3875 3880 3885 3890 3895 3900 3905 3910 3915 3920 3925 3930 3935 3940 3945 3950 3955 3960 3965 3970 3975 3980 3985 3990 3995 4000 4005 4010 4015 4020 4025 4030 4035 4040 4045 4050 4055 4060 4065 4070 4075 4080 4085 4090 4095 4100 4105 4110 4115 4120 4125 4130 4135 4140 4145 4150 4155 4160 4165 4170 4175 4180 4185 4190 4195 4200 4205 4210 4215 4220 4225 4230 4235 4240 4245 4250 4255 4260 4265 4270 4275 4280 4285 4290 4295 4300 4305 4310 4315 4320

PETROV, B.P., kand. tekhn. nauk, dotsent

Electrification of transportation and its future development
in the light of the plan of the State Commission for the
Electrification of Russia. Trudy MEI n. 34: 1954-1955. 1955.
MIRA 1955.
(Railroads--Electrification)

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- 17 -

BATALOV, Nikolay Mikhaylovich; PETROV, Boris Patrovich; BARSKIY, M.R.,
kand. tekhn.nauk, retsenzent; KRICHKO, A.I., inzh., retsen-
zent; STEPANOV, A.D., doktor tekhn. nauk, retsenzent;
SIDOROV, N.I., inzh., red.; LAMONOV, G.Ye., tekhn. red.

[Electric traction machinery] Tiagovye elektricheskie apparaty.
Moskva, Gos. energ. izd-vo, 1961. 207 p. (MIRA 15:3)
(Electric machinery) (Electric railroads)

PETROV, B.P., dotsent, kandidat tekhnicheskikh nauk.

Utilizing the adhesion weight of electric trains in starting and
breaking traction engines. Elektrichestvo no.1:30-34 Ja '57.

(MLRA 10:2)

1. Moskovskiy energiticheskiy institut im.Molotova.
(Electric locomotives)

PETROV, B.P., kand. tekhn. nauk

Combined control of electric locomotives with radio receivers

Vest. elektroprom 32 no.5:21-26 My '61. MIB 15

(Electric locomotives)

PETROV, Boris Petrovich; STEPANOV, Aleksandr Dmitriyevich; CHERNYI, M.I.,
redaktor; PRIDKIN, A.M., tekhnicheskiy redaktor

[Operation of electric rolling stock] Upravlenie elektricheskimi
podvizhnym sostavom. Moskva, Gos. energ. izd-vo, 1956. 304 p.
(Electric railroads) (MLRA 9:12)

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"The problem of ...
and ...
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Survey of ...
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Stock 8 During Slippage of Electric Traction Rolling

Stock s During Slippage of Electric Traction Rolling

PETROV, B.P., kandidat tekhnicheskikh nauk, dotsent.

Automatic control of electric trains with ion converters. Elektrichestvo
no.9:38-43 S '53. (MLBA 5:2)

1. Moskovskiy energeticheskiy institut im. Molotova.
(Electric railroads) (Automatic control)

PETROV, B.P., kand.tekhn.nauk, dotsent; KOCHURAYEV, L.D., inzh.

Present state and principal trends in the automation of the
control processes of electric rolling stock. Elektrichestvo
no.1:26-32 Ja '63. (MIRA 16:2)

1. Moskovskiy energeticheskiy institut (for Petrov). 2. Novo-
cherkasskiy elektrovozostroitel'nyy zavod (for Kochurayev).
(Automatic control) (Electric railroads)

USSR/Electricity - Traction, Elec- Jun 51
tric
Controllers, Speed

"An Examination of a Vibrating Acceleration Regular," B. P. Petrov, Cand Tech Sci, Moscow Power Eng Inst Iment Molotov

"Elektrichestvo" No 6, pp 47-51

Examines the theory of the vibrating acceleration regulator. Gives theoretical and test data. Lists factors affecting the characteristics of automatic-control systems

200T15

USSR/Electricity - Traction, Electric Jun 51
(Contd)

of elec rolling stock when using a vibrating acceleration regulator. Submitted 25 Oct 50.

200T15

PETROV, B.P.

PETROV, B.P., dotsent, kandidat tekhnicheskikh nauk.

Transitional processes in schemes of smooth automatic rheostat
control of electric traction equipment. Elektrichestvo no.4:29-32
Ap '54. (MLRA 2:5)

1. Moskovskiy energeticheskiy institut im. Molotova.
(Electric railroads)

59266

SOV/12-59-17-37459

9.1300

Translation from: Referativnyy zhurnal. Elektrotehnika, 1959, Nr 17, pp 233-234 (USSR)

AUTHOR: Petrov, B.P.

TITLE: Complex Input Conductances of Resonators Radiating Through a Slot

PERIODICAL: Tr. Mosk. energ. in-ta, 1957, Nr 29, pp 263-271

ABSTRACT: Space density of a magnetic current inside the resonator, natural functions of an unperturbed resonator and a resultant tangent magnetic field vector on the slot are given. The slot antenna is replaced by the magnetic flux; the volume is divided into a semi-space and a resonator cavity, and the solutions of Maxwell equations for each region are "sewed together" on their boundary. The solutions of Maxwell equations give expressions for E and H fields in any point of the semi-space, the resonator cavity and on the slot. Relations between the amplitudes in the antinode of the exciting magnetic flux and in the antinode of the radiating magnetic flux are determined, which enables one to find the complex input conductance. Some additional transformations in this method make it possible to determine the input conductance of a resonator radiating through a slot into space with any boundary conditions.

L.B.F.

PIROV, B.P., kand. tekhn. nauk, dots.

Transients during skidding of wheels of electric trains.

Elektrichestvo no. 10:48-52 0 '58. (MIRA 12:1)

1. Moskovskiy energeticheskiy institut.
(Transients (Electricity)) (Electric railroads)

PETROV, B.P.

Complex input conductivities of resonators radiating through a gap.
Trudy MEI no.29:263-271 '57. (MIRA 17:3)
(Electric resonators)

PETROV, B.P., inzh.

What's new in the production technology of lightweight mixes
to be used in making construction elements. Stroif. mat. 5 no.1:
30-32 Ja '59. (MIRA 12:1)
(Lightweight concrete) (Mixing machinery)

MERENKOV, Boris Yakovlevich; PETROV, B.P., otvetstvennyy red.; SLUTSKER, A.S.;
RYLINA, Yu.V., tekhn.red.

[Genesis of chrysotile-asbestos] Genezis khrizotil asbesta. Moskva,
Idz-vo Akad. nauk SSSR. 1958. 134 p. (Akademiia nauk SSSR. Institut
geologii rudnykh mestorozhdenii, petrografii, mineralogii i geokhimii.
Trudy no.22) (MIRA 11:7)
(Chrysotile) (Asbestos)

1. The first part of the document is a list of the names of the individuals who were involved in the project. The names are listed in alphabetical order. The names are: [illegible]

2. The second part of the document is a list of the dates when the individuals were involved in the project. The dates are listed in chronological order. The dates are: [illegible]

3. The third part of the document is a list of the locations where the individuals were involved in the project. The locations are listed in alphabetical order. The locations are: [illegible]

4. The fourth part of the document is a list of the activities that the individuals were involved in. The activities are listed in alphabetical order. The activities are: [illegible]

5. The fifth part of the document is a list of the results of the project. The results are listed in alphabetical order. The results are: [illegible]

Electrical Engineering Abst.
Vol. 57 No. 675
Mar. 1954
Electrical Engineering

174/10
6-3-54
621.337.1.078
1088. Automatic control of an electric train with electronic converters. B. P. Petrov. *Elektrichestvo*, 1953, No. 9, 38-43. In Russian.

The fundamentals of automatic control circuits using electronic converters are considered, in particular the influence of the parameters of the acceleration regulators on the stability, transient and steady operating conditions with individual and parallel action of the control systems. It is found that the complete characteristic of the transient processes in systems of smooth automatic train control with the use of electronic converters is obtainable only if all the important inertia elements and other elements of the control system are considered, as well as their combined or parallel operation with other electric systems on the train. Stability and transient process calculations carried out for the saturated and unsaturated sections of the characteristics of the traction motors enable the operating characteristics of the control system to be determined with adequate accuracy. They form a reliable foundation for all the necessary tests to be carried out on the actual system.

B. P. KRAUS

PETROV, B.P.

Influence of the e.m.f. of self-induction in circuits of traction motors on the slipping of the wheels during acceleration and braking periods. Elektrichestvo, '62, No.11, 40-1. (MIRA 5 11)

1. PETROV, B. P., Docent
2. USSR (600)
4. Electric Railway Motors
7. Effect of the self-inductive electromotive force in circuits of electric traction motors on the slipping of wheels during skidding and dragging, Elektrichestvo, No. 11, 1952.
9. Monthly List of Russian Accessions, Library of Congress, February 1953, Unclassified.

P. P. P.

USSR/Engineering
Railroads - Rolling Stock
Railroads, Electric
Aug 1947

"Transitory Phenomena in Rolling Stock Systems with
Compound Engines," B. P. Petrov, 2 1/2 pp

"Elektrichestvo" No 8

Discussion of the capacities of systems providing
smooth transfer of energy from one group of engines
to another. Describes experiments conducted using
two type DK-251 A engines. One of the more impor-
tant conclusions obtained was the fact that the
fluctuation of the current and of the supplementary
power increase in the compound engine system (at the
time of transfer from one grouping to another) is 18-25%.

USSR/Engineering (Contd)
Railroads - Rolling Stock
Railroads, Electric
Aug 1947

much larger than in engines which are hooked up in
series.

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USSR/Electricity - Electric Traction Nov 52

"Influence of the EMF of Self-Induction in the Traction Motor Circuit on Wheel Slipage During Acceleration and Electric Braking," Doc B. P. Petrov, Cand Tech Sci, Moscow Power Eng Inst Iment Molotov

"Elektrichestvo" No 11, pp 40-45

Demonstrates that, in certain cases, emf of self induction in motor circuit has considerable influence on wheel slipage process. Gives approximate solution of differential eq for wheel

240764

motion during acceleration and elec braking, taking into account inductance of traction motor circuit. Gives numerical examples using motor DPE-340 operating at 1,500 and 3,000 v. Submitted 5 Mar 52.

240764

Petrov, B. P.

USSR/Electricity - Traction, Electric Apr 51
Stability

"Study of the Stability of Direct-Current Circuits
in Electric Locomotives," Docent B. P. Petrov,
Cand Tech Sci, Moscow Power Eng Inst Imeni
Molotov

"Elektrichestvo" No 4, pp 44-48

Discusses method of investigating stability of
starting and braking circuits of railway motors.
Method is based upon use of stability criteria and
Kirchoff's laws. Submitted 28 Oct 50.

FDD

178r63

PETROV, B.P., kand.tekhn.nauk, dotsent

Concerning factors which facilitate the realization of high
coupling coefficients in rolling stock. Elektrichestvo no.7:
35-41 JI '61. (MIRA 14:9)

1. Moskovskiy energeticheskiy institut.
(Electric railroads--Rolling stock)

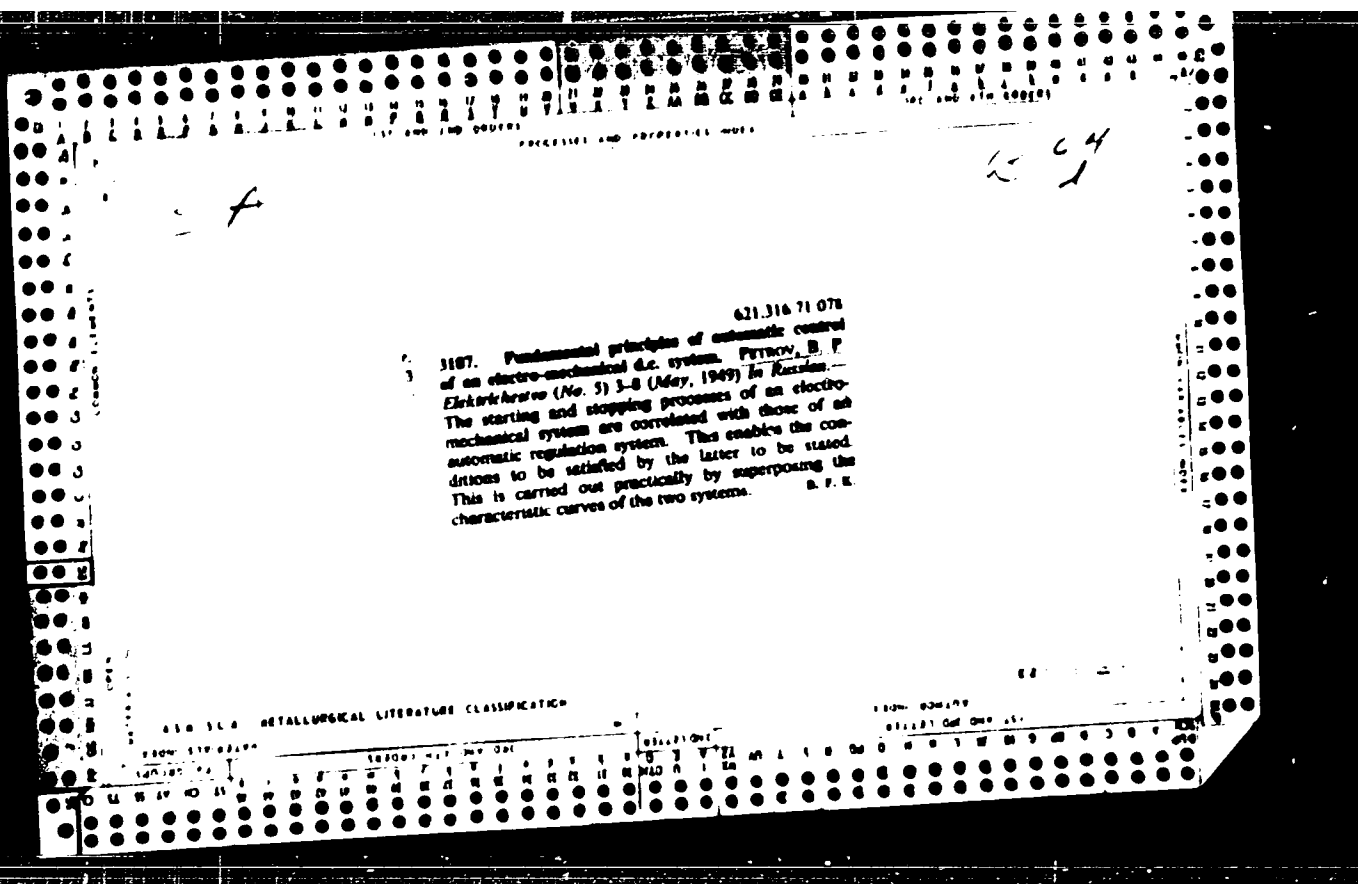
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621.716.718

6213. Investigation of a vibration-type acceleration regulator. (Zh. Tekhn. Fiz., No. 6, 47-51 (June, 1951) in Russian.)
Various types of acceleration regulators are used in d.c. traction for automatic resistance control with a motor-controlled multi-stage group controller. They maintain the necessary static characteristic of the control system. For this purpose vibration-type acceleration regulators are widely used. The problem considered is whether it is possible to obtain the optimum type of characteristic, in other words, whether a perfect matching of the parameters of regulator, drive and controller can be obtained. The complications of the electro-mechanical system make a strict solution of this problem impossible, as no single system of equations could represent the discontinuities of forces, speeds and accelerations during the "notching" adequately. However, a step-by-step analysis on greatly simplifying assumptions is possible. An outline of which is given and experimental curves are derived indicating that the desired result could be obtained with vibration regulators.

B. F. Kraus



3637. Investigation of the stability of the circuits of d.c. traction systems. B. P. PRYDOR. *Elektricheskoe*, No. 4, 44-7 (April, 1951) in Russian.

Hurwitz' stability criterion introduced into a method of stability analysis suggested by A. Kh. Zilberthal enables the magnetization curves of the traction motors to be replaced by straight lines, namely by their straight parts which correspond to the actual operating range. This method is shown by examples of comparatively simple traction systems. They refer to rheostat braking of a pair or of series motors with cross-connected windings and semi-crossed windings and regenerative braking with independent excitation and stabilizing resistance. More complicated systems which are planned for modern traction equipment (e.g. cyclic 4-motor system and double-cyclic 6-motor system for rheostatic braking; regenerative system with cyclic stabilization, etc.) may also be treated. It may be further improved by introducing stability criteria other than that of Hurwitz. The transient processes in any part of the system may be fully represented. It is also possible to exclude the load branch or the external system from the stability considerations, unless transient phenomena are investigated. The method mainly uses the contour currents and is analogous to the method of virtual work in mechanics. B. P. PRYDOR

PERROV, B. P.

3278. Transient processes in circuits for step-less automatic rheostatic control of electric trams. B. P. PERROV. *Elektricheskoe*—1954, No. 4, 29-32, 1 diagram.

The method of representing the system of equations describing transient conditions in a closed-loop control system—resulting in a non-linear differential equation—in the phase plane leads to an approximate solution of this differential equation for some important cases and enables the main parameters of the control system to be predetermined, where the inertia of the servodrive, inductance of the circuit and the real form of the magnetization curve of the traction motor may be considered. Calculated examples confirm the author's opinion that the optimum form of the characteristic of the control system may be obtained by combining the characteristics independent of the current (for the initial phase of the transient process) with the characteristic dependent on the current (for the final phase).

B. P. PERROV

SRV/58-59-5-11286

Translation from Referativnyy Zhurnal Fizika, 1969, Nr 5, p 195 (USSR)

AUTHOR: Petrov, B P

TITLE Complex Slot-Radiation Resonator Input Conductance

PERIODICAL In Mosk. energ. fizika, 1969, Nr 29, pp 253 - 254

ABSTRACT The article has not been reviewed

Card 1/1

30V/58-59-5-11284

Translation from Referativnyy Zhurnal Fizika, 1959, Nr 5, p 195 (USSR)

AUTHOR Petrov, B P

TITLE: Slot-Radiation Resonator Input Resistances

PERIODICAL Tr Iaganrogsk radiotekhn in-ty, 1958, Vol 2 pp 63-64

ABSTRACT: Using the well-known results of the problem of forced resonator oscillations, the author attempts to derive a general expression for resonator input resistance in the presence of a radiating slot.

V V Nikol'skiy



Card 1/1

NOV/88-9-20-11268

Translation from Referativnyy Zhurnal Fizika, 1969, No 5, p 175 (USSR).

AUTHOR Petrov, B P

TITLE Slot-Radiation Resonator, Input Resistance and Input Conductance
Steadiness

PERIODICAL In Taganrogsk. radiotekhn. in-ta, 1968, Vol 2, pp 75 - 82

ABSTRACT The author analyzes the results of his previous study (abs 11264).
He shows their steadiness with respect to the slot field-distribution
function

Card 1/1

MINOV, D.K., prof., doktor tekhn.nauk; PETROV, B.P., kand.tekhn.nauk

Automatic control of electric locomotives. Zhel.dor.transp.
42 no.5:14-17 My '60. (MIRA 11:9)
(Electric locomotives) (Automatic control)

PETROV, B. S.
25655

Kakuyu Produktsiyu Dolzhna Davat' Derevoob-
abatyvayushchaya Promyshlennost(
Les, 1948, No. 3, s. 28-31

SO: LETOPIS NO. 30, 1948

1. The first part of the document is a list of the names of the individuals who were involved in the project.

2. The second part of the document is a list of the names of the individuals who were involved in the project.

3. The third part of the document is a list of the names of the individuals who were involved in the project.

PETROV, B.S., doktor ekonomicheskikh nauk.

Labor and wage standards in the wood-processing industry. Der.1
lesokhim.prom. 3 no.9:26-28 S '54. (MLBA 7:9)

1. Leningradskaya ordena Lenina lesotekhnicheskaya akademiya im.
S.M.Kirova.

(Wood-using industries) (Work, Method of) (Wages)

PETROV, Boris Sergeyevich, professor; MITIN, Aleksey Grigor'yevich, dotsent;
SITKHINA, Dina Yefimovna, dotsent; SAMENULO, Grigoriy Mikhayevich,
dotsent; VASIL'YEV, P.V.; professor, retsenzent; DIESPEROV, V.S.,
inzhener, retsenzent; KOPTOV, G.YE., redakter; ARNOL'DOVA, K.S., redak-
ter; SHITS, V.P., tekhnicheskiy redakter. (MLRA 9:4)

[Organization and planning of production in wood processing enterprises]
Organizatsiia i planirovanie proizvodstva na dereveobrabatyvalushchikh
predpriyatiyakh. Moskva, Gosbumizdat, 1955. 407 p.
(Woodworking industries)

PETROV, B.S., doktor ekonomicheskikh nauk.

Speed up specialization and cooperation in Leningrad furniture
factories. Der. prom. ' no.10:23-24 O '56. (MLRA 9:11)

1. Leningradskaya lesotekhnicheskaya akademiya imeni S.M. Kirova.
(Leningrad--Furniture industry)

SITKINA, Dina Yefimovna; ILENKO, A.S., red.; GOSPOLANSKAYA, T.N.,
red. izd-va; AD POVA, N.Y., tekhn. red.

[Establishing technical work norms in woodworking industry
enterprise.] Tekhnicheskoe normirovanie truda na predpri-
yatiakh lesoobrabatyvayushchei promyshlennosti. Moskva,
Izd-vo izdat, 1968. 48 p. (MIRA 17:3)

NECHUYATOVA, Nina Pavlovna; PETROV, B.S., red.; MAKSAKOVA, A.M.,
red.izd-va; GRECHISHCHEVA, V.I., tekhn.red.

[Geographical distribution of the woodworking industry
of the U.S.S.R.] Geograficheskoe razmeshchenie derevo-
obrabatyvaiushchei promyshlennosti SSSR. Moskva, Gos-
lesbumizdat, 1963. 286 p. (MIRA 17:2)

SAMENULO, Grigoriy Mikhayevich; PETROV, B.S., red.; GORYUNOVA, L.K.,
red.izd-va; BRATISHKO, L.V., tekhn.red.

[Organization of business accounting in woodworking enterprises]
Organizatsiia vnutrizavodskogo khoziaistvennogo rascheta na
derevoobrabatyvaiushchikh predpriiatiakh. Moskva, Goslesbum-
izdat, 1958. 78 p. (MIRA 12:8)
(Woodworking industries--Management)

PETROV, B.S., doktor ekon.nauk

Specialization and cooperation of enterprises of the furniture
industry. Der.prom. 8 no.3:23-25 Mr '59. (MIRA 12:4)

1. Lesotekhnicheskaya akademiya im. S.M. Kirova.
(Furniture industry)

NICHKOV, V.N.; PETROV, B.S., prof., red.; ANDREYEV, O.N., red.izd-va;
RASSUZHDAYEV, A.V., red.izd-va; PAVLOVSKIY, A.A., tekhn.red.

[Development of Soviet lumber export] Razvitie sovetskogo
legnogo eksporta. Moskva, Vneshtorgizdat, 1959. 293 p.
(MIRA 12:7)

(Lumber trade)

PETROV, Boris Sergeyevich, prof., doktor ekon. nauk; VOLKOV, N.Ya., retsen-
zent; SITKHINA, D.Ye., red.; POLUNICHEV, I.A., red. izd-va; PARAKHINA,
N.L., tekhn. red.

[Production organization and planning in the woodworking industries]
Organizatsiia i planirovanie proizvodstva na derevoobrabatyvaiushchikh
predpriiatiakh. Moskva, Goslesbumizdat, 1970. 312 p. (MIRA 14:6)

1. Starshiy inzhener sektora derevoobrabotki lesnogo otdela Gosplana
SSSR (for Volkov)

(Woodworking industries--Management)

SAMKNULO, Grigoriy Mikheyevich; PETROV, B.S., red.; AZAROVA, V.G.,
red. izd-va; PARAKHINA, N.L., tekhn. red.

[Analyzing the production and economic activities of wood-
working enterprises] Analiz proizvodstvenno-khoziaistvennoi
delatel'nosti derevobrabatyvalushchikh predpriatii. Mo-
skva, Goslesbuzizdat, 1961. 179 p. (MIRA 15:2)

(Woodworking industries)

SITKHINA, Dina Yefimovna, dots.kand.ekon.nauk; DELIMOV, A.I., kand.ekon.nauk, retsenzent; BOYTSOV, K.P., kand.ekon.nauk, retsenzent; PETROV, B.S., prof., doktor ekon.nauk, otvetstvennyy red.; BRUK, A.Ya., red.

[Organization and planning of production at enterprises of the wood pulp and wood chemical industries; manual on planning for students in engineering and economics departments] Organizatsiia i planirovanie proizvodstva na predpriatiakh tselliulozno-khimi-cheskoi i lesokhimicheskoi promyshlennosti; rukovodstvo k kursovomu proektirovaniu dlia studentov inzhenerno-ekonomicheskogo fakul'teta. Leningrad, Izd. VZLTI, 1956. 86 o. (MIRA 11:4)
(Wood-using industries)

SAMKNULO, Grigoriy Mikhayevich; PETROV, B.S., red.; GORYUNOVA, L.K., red.
izd-va; BRATISHKO, L.B., tekhn. red.

[Organization of economic accountability within sections of wood-
working plants] Organizatsiia vnutrizavodskogo khoziaistvennogo
rascheta na derevoobrabatyvayushchikh predpriyatiyakh. Moskva,
Goslesbumizdat, 1958. 78 p. (MIRA 11:7)
(Woodworking industries--Accounting)

CHIRKOV, Aleksandr Vasil'yevich; PETROV, B.S., red.; KHOT'KOVA, Ye.S.,
red. izd-va; VDOVINA, V.M., tekhn. red.

[Business accounting within the plant in the woodpulp and paper
enterprises] Vnutrizavodskii khoziaistvennyi raschet na tselliu-
lozno-bumazhnykh predpriatiakh. Moskva, Goslesbumizdat,
1963. 173 p. (MIRA 15:6)
(Woodpulp industry--Accounting)

1. The first part of the document is a list of the names of the individuals who were involved in the project. The names are listed in alphabetical order. The names are: [illegible]

L 28479-66 EWT(m)/EWA(d)/EWF(t)/ETI IJP(c) JD/JG

ACC. NR. AP6010137

SOURCE CODE: UR/0133/66/000/003/0253/0257

AUTHOR: Sidel'kovskiy, M. P. (Candidate of technical sciences); Tyurin, Ye. I. (Candidate of technical sciences); Danilin, V. I. (Candidate of technical sciences); Frantsuzov, S. N. (Engineer); Sinolit'skiy, K. A. (Engineer); Stromova, R. P. (Engineer); Antipova, K. I. (Engineer); Selivanov, V. M. (Engineer); Petrov, B. S. (Engineer)

ORG: Volgograd Scientific Research Institute of Machine Building Technology (Volgogradskiy n.-i. institut tekhnologii mashinostroyeniya); Krasnyy Oktyabr' Plant

TITLE: Effect of treatment with minute amounts of boron on the properties of Kh23N18 chromium-nickel steel

SOURCE: Stal', no. 3, 1966, 253-257

TOPIC TAGS: stainless steel, boron, chromium steel, nickel steel, metal melting, weldability, metal scaling / Kh23N18 Cr-Ni stainless steel

ABSTRACT: This effect was investigated for 12 laboratory melts and 45 industrial melts of Kh23N18 stainless heat-resistant chromium-nickel steel (0.08-0.13% C, 1.44-1.82% Mn, 0.20-0.47% Si, 22.05-24.30% Cr, 18.48-19.24% Ni, 0.013-0.033% P, 0.006-0.020% S). (The industrial melts contained 0.18-0.29% Cu.) Boron was added to the laboratory melts in the form of 28% ferroboron prior to tapping, and to the industrial

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ACC NR: AP6010137

melts in the form of 10% ferrobore while filling the bottom one-third of the ladle, in proportions of 0.0047-0.0015%. Specimens taken from the ingots, after their hot and cold working, were subjected to microstructural examination and X-ray diffraction analysis. Findings: "microtreatment" with boron affects the structure and phase composition of stainless steels of the Kh23N18 type. At ~1150°C the segregation of a boride phase, clearly visible under an optical microscope, is observed. In the temperature range 1050-1200°C and particularly at 1100-1150°C, treatment with minute amounts of B markedly enhances the plasticity of Kh23N18 steel thus reducing its susceptibility to external defects when rolled in a blooming mill. Under optimal conditions of final deoxidation (with 0.4-0.8 kg of Al per ton) prior to addition of boron, the percentage of defect-free slabs markedly increases and the labor requirement of finishing operations decreases; at the same time, savings of Ni are achieved. (To enhance the effectiveness of treatment with boron, final deoxidation with Al is required, since Al prevents the fixation of B by nitrogen and thus increases the degree of the assimilation of B.) If the B content is 0.003% and more, Kh23N18 steel becomes more prone to cracking during argon-arc welding whereas if the B content is 0.0015% and Al is used as the deoxidant, the weldability of this steel is as good as that of its boron-free counterpart. The addition of B within the limits investigated (up to 0.0047% inclusively) increases the resistance of Kh23N18 steel to scaling at 1000°C and when the B concentrations reach approximately 0.003-0.004%, also at 1100°C. Orig. art. has: 4 figures.

SUB CODE: 11, 13/

SUM DATE: none/ ORIG REF: 003/ OTH REF: 002

Card 2/2 *PC*

PTM V, B.S.; AKIM II, P.A.

2. Information available to anyone for production of a document, including industrial, boards, and public information, is to be made available to the public.

[illegible]

MATEVOSYAN, F.A., inzh.; SELIVANOV, V.M., inzh.; PETROV, B.S., inzh.;
ANDREYEV, V.A., inzh.; TAPASHCHENKO, P.Ya., inzh.

Preventive measures against cracks in Kh25T steel ingots.
Stal' 25 no.10:913-914 O '65. (MIRA 19:11)

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L 1942-66 EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EMP(k)/EMP(z)/EMP(b)/EWA(c) MJW/JD/HW
 ACCESSION NR: AP5025133 UR/0133/65/000/010/0913/0914 73
 669.187.2 4/0

AUTHOR: Matevosyan, P. A. (Engineer); Selivanov, V. M. (Engineer); Petrov, B. S. (Engineer); Andreyev, V. A. (Engineer); Tarashchenko, P. Ya. (Engineer) 4/55

TITLE: Ways of combating cracks in Kh25T steel slabs 16

SOURCE: Stal', no. 10, 1965, 913-914

TOPIC TAGS: Kh25T steel, metal surface, annealing, metal rolling

ABSTRACT: Cracks and fractures in Kh25T steel slabs are caused by internal strain arising during the cooling of slabs after blooming. Changing of the methods of melting of this steel in open arc furnaces does not have any substantial effect on the elimination of this defect. The use of sheet ingots is also ineffective. Rolling of the slabs on a sheet mill in the hot state immediately after blooming or after a special heat treatment (annealing) eliminates the cracks, but cannot be recommended because of the poor quality of the surface of the sheets obtained. A complete prevention of the defect (for any chemical composition within the standard requirements and with the allowed content of nonmetallic inclusions) is achieved by annealing the slabs and preheating them before they are placed in the holding

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ACCESSION NR: AP5025133

27
furnace for heating prior to sheet rolling. Engineers K. I. Antipov, S. A. Borodina, K. V. Belyakova, L. Ye. Vatnik, V. I. Danilin, M. N. Kul'kova, A. P. Okenko, P. Ya. Tarashchenko, and G. D. Shurygin took part in the work. Orig. art. has: 1 figure, 2 tables.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: MM

NO REF SOV: 003

OTHER: 000

Card 2/2

GURIN, L.Ye.; TSVENEV, V.L., inzh., re'senzent; PETROV, B.S., prof.,
doktor ekon. nauk, red.; MIROSHNICHENKO, E.A., red. izd-va;
BORODULINA, I.A., red. izd-va; SPERANSKAYA, O.V., tekhn. red.

[Wage payment system in a machinery manufacturing enterprise]
Organizatsia zarabotnoi platy na mashinostroitel'nom pred-
priis'tii. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit.
lit-ry, 1960. 178 p. (MIRA 13:11)
(Machinery industry) (Wage payment systems)

GUAIN, Lev Yevseyevich; LETNOV, D.S., red.

(Improving the organization of auxiliary operations in
the machinery industry) Sovetskoye upravleniye organizatsii
raboty vspomogatel'nykh sluzhb v mashinostroyeni. Le-
ningrad, 1965. 28 p. (MIRA 18110)

PETROV, B.S.

Birds in the lower Dnieper bottomlands. Uch.zap. ~~KGU~~ 52:105-130
'54. (MIRA 11:11)

1. Kafedra zoologii pozvonochnykh Khar'kovskogo gosudarstvennogo
universiteta (zav. - prof. I.B. Volchanetskiy).
(Dnieper Valley--Birds)

TSILIPOTKINA, M.V.; TAGER, A.A.; PETROV, B.S. [deceased];
PUSTOBAYEVA, G.

Evaluation of the packing density of solid polymer chains.
Part 5: Determination of the specific surface area of polymers
by means of nitrogen vapor sorption. Vysokom. soed. 4
no.12:1844-1850 D '62. (MIRA 15:12)

1. Ural'skiy gosudarstvennyy universitet imeni A.M. Gor'kogo.
(Polymers) (Nitrogen) (Sorption)

PPTR V, B... ing-yev... A. eksanin vish
Inzh. NIKIFOR... KAYA, T. N. ...
Izd-va ... VA ...

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